

CDC's National Asthma Control Program



# An Investment in America's Health







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2013

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# Executive Summary

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Asthma is a lifelong disease that causes wheezing, breathlessness, chest tightness, and coughing. During an asthma attack, airways become inflamed, making breathing difficult. Asthma attacks can be mild, moderate, or serious—even life-threatening. But with appropriate care and education, people living with asthma can manage their condition. Asthma control improves quality of life, decreases medical expenditures, and increases productivity at work and school.

The Centers for Disease Control and Prevention's (CDC's) National Asthma Control Program (NACP) helps millions of Americans understand, manage, and gain control over their asthma. CDC launched the NACP in 1999 to address the rising public health impact of asthma. The program leads national initiatives and provides state funding for a variety of activities focused on surveillance, intervention, partnerships, and evaluation. These activities have provided millions of people with asthma the essential tools for controlling their disease and helped them understand how to improve the quality of their lives through proper asthma management. NACP-funded activities have also educated families, providers, and school systems about preventing asthma attacks. Since 1999, the NACP has worked with partners to:

- Establish a coordinated national public health response to control asthma.
- Build and sustain asthma control programs in 34 states, the District of Columbia, and Puerto Rico.
- Support national and state asthma surveillance systems.
- Improve asthma management in schools across the country.
- Evaluate programs to identify and share best practices.
- Target interventions to populations and communities disproportionately affected by asthma.
- Share CDC expertise with state and local public health practitioners.
- Fund over 120 positions in health departments nationwide and support more than 160 contracts for asthma services created by the Program.

The NACP's return on investment is compelling: for every dollar spent on national and state-level programs, \$71 in asthma-related expenditures is saved. This is a strong indication that the nation is on track to curb the burden of asthma. To sustain and build upon these efforts, the NACP must continue to lead the public health response to asthma control by helping millions of people with asthma gain control over their lives, thereby reducing the national burden of asthma.

## About Asthma

Asthma is a common, chronic disorder of the airways characterized by wheezing, breathlessness, chest tightness, and coughing at night or early in the morning, known as asthma exacerbations or attacks. Airflow is obstructed by factors which narrow airways in the lungs in reaction to certain exposures or “triggers,” making it hard to breathe.

## Asthma Triggers

- Airborne allergens (e.g., pollen, mold, animal dander, dust mite, and cockroach allergens)
- Airway infections
- Occupational exposures (e.g., sensitizing chemicals or dusts)
- Airborne irritants (e.g., particulate matter and environmental tobacco smoke)
- Exercise

## Populations Most at Risk for Asthma

- Children, women, black and multi-race Americans, and American Indians and Alaska Natives

## Asthma by the Numbers

- Children who had asthma in 2011: 7.1 million
- Deaths from asthma in 2010: 3,404
- Visits to hospital outpatient departments with asthma as primary diagnosis in 2009: 1.2 million
- Visits to emergency departments with asthma as primary diagnosis in 2009: 2.1 million
- Yearly medical expenses per person with asthma from 2002 to 2007: \$3,300

## Evidence-based Prevention Strategies

- Patient education
- Consistent and correct use of preventive medication
- Control of environmental factors (e.g., triggers) that affect asthma



# CDC's National Asthma Control Program

## *An Investment in America's Health*

### Reducing the Burden of Asthma

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The burden of asthma is characterized by the numbers of asthma-related hospitalizations, emergency room visits, deaths, school days missed, and other factors such as activity limitations. Because asthma has no known cure, the most effective way to manage it is by preventing the need for frequent, costly medical treatment due to uncontrolled symptoms and attacks. The NACP's overarching goal is to provide people the tools to manage their asthma successfully, thereby reducing the collective burden of asthma.

#### Prevalence

Asthma continues to be a major public health concern. The number of reported cases has steadily increased since 1980, with the most rapid growth occurring from 1980-1996. In 2001, 20 million people (1 in 14) had asthma. By 2011, that number had grown to 26 million (1 in 12). The highest rates of asthma occur among children, women, multi-race and black Americans, and American Indians and Alaska Natives. In 2009 alone, there were over two million asthma-related emergency department visits and almost half a million hospitalizations; in 2010, 156 children and 3,248 adults died from asthma.

#### Economic Impact

From 2002-2007, medical expenditures due to asthma hospitalizations and emergency room visits increased from \$48.6 billion to \$50.1 billion or about \$3,300 per person with asthma each year. When indirect costs due to days missed at school and work are factored in, that number climbs to \$56 billion.

#### The Goal of NACP: Asthma Control and Management

Fortunately, asthma symptoms and costs can be controlled when people have the appropriate care, education, and guidance to manage their condition. Reducing exposure to triggers, treating patients with medications such as inhaled corticosteroids, and educating patients and caregivers can mitigate the severity of asthma symptoms and frequency of attacks. In 1999, CDC created the NACP to develop interventions based on these principles and reduce the societal and economic burden of asthma in the U.S.

## Progress in Controlling Asthma

The NACP has made significant progress in controlling asthma in the U.S. Over the last 12 years, costs due to asthma illness and death have decreased by \$23.1 billion, representing an estimated return on investment of \$71 saved for each dollar spent. These savings reflect a shift from visits to more costly medical settings (hospitals and emergency rooms) to less expensive primary care settings (doctor offices and outpatient clinics). In addition, asthma death rates have decreased by 27% since 1999.

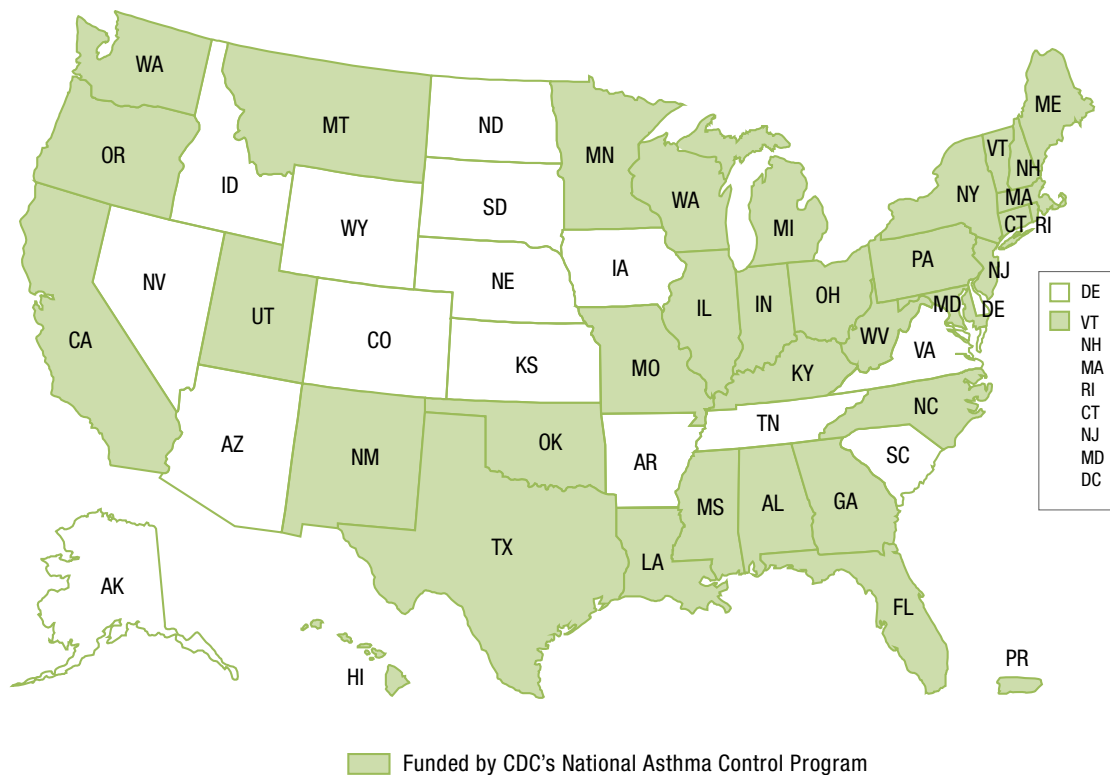
## Leading A Coordinated Public Health Response

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Before 1999 the lack of high quality asthma surveillance within populations limited public health practitioners' ability to implement effective asthma control measures. With only national-level statistics they could not answer these basic questions: Who has asthma? Who suffers from asthma attacks? Among which populations is asthma increasing the fastest? In response in 1999, CDC announced the availability of funds for a new cooperative agreement program, *Addressing Asthma from a Public Health Perspective*. The objectives of the program were to

1. Focus on asthma-related activity within the state health agency
2. Increase understanding of asthma-related data and their application to program planning by developing an ongoing surveillance system
3. Increase state and territory use of a public health approach to reduce the burden of asthma
4. Link the health agency to the many agencies and organizations addressing asthma in the population
5. Participate in intervention program activities

CDC initially awarded grants to four states—Illinois, Minnesota, Oregon, and Rhode Island—and established the NACP to administer the cooperative agreements and provide technical assistance as states implemented and grew their programs. Since then the program has expanded to support 34 states, the District of Columbia, and Puerto Rico (see Figure 1).

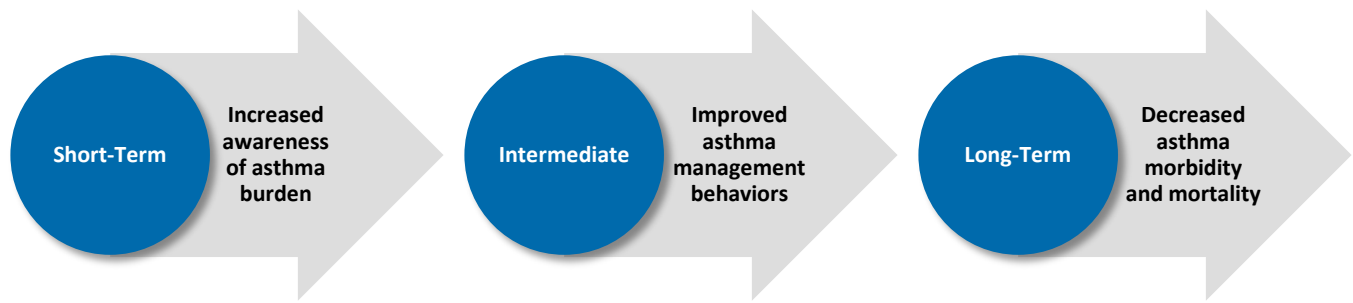


**Figure 1.** NACP-funded States, 2013.

## Measures of Success

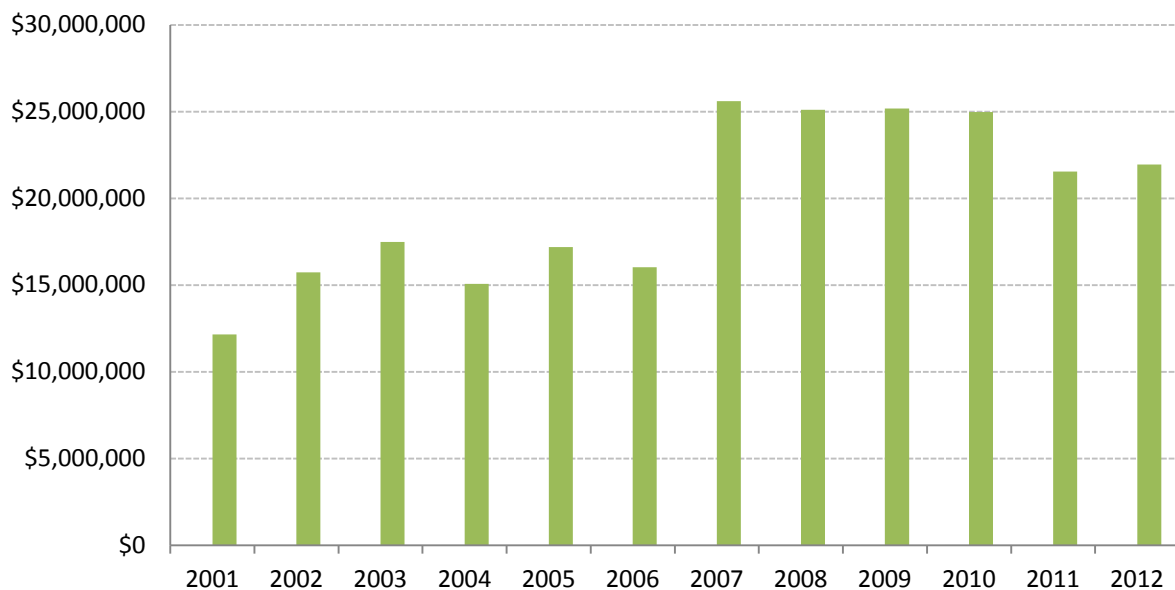
Controlling asthma requires a multifaceted approach focusing on patient behaviors; home, work, and school environments; knowledge and skills of health care providers; and public health programs and policies that influence asthma management practices. Highly effective asthma control programs conduct activities that target these components and lead to a reduced burden of asthma. These activities include improving surveillance to track asthma more effectively, training health professionals using the best available science, and educating individuals with asthma and their families.

To measure the success of their efforts, asthma program evaluators assess a number of short- to long-term outcomes. These include increased patient awareness of asthma self-management skills, improved medical management of asthma, increased understanding of asthma disparities by state and local health departments, and changes in public health practice affecting asthma management. These outcomes ultimately lead to a reduced burden of asthma: fewer asthma-related hospitalizations and deaths, fewer school and work days missed, decreased disparities in asthma outcomes among various affected populations, and improved quality of life for people living with asthma (see Figure 2).



**Figure 2.** Example of short-, intermediate-, and long-term outcomes associated with asthma control program activities supported by NACP.

Since 2001, the NACP has provided \$238 million to state and territorial asthma programs, national non-governmental organizations, and local communities to implement asthma activities (see Figure 3). NACP also conducts national asthma activities and provides technical assistance to various partners and communities in the U.S. Some state programs rely almost exclusively on NACP funding to sustain their programs, while others have successfully leveraged NACP funding to bring in additional funds from grants, tobacco and other tax revenue, and various federal and state public health programs.



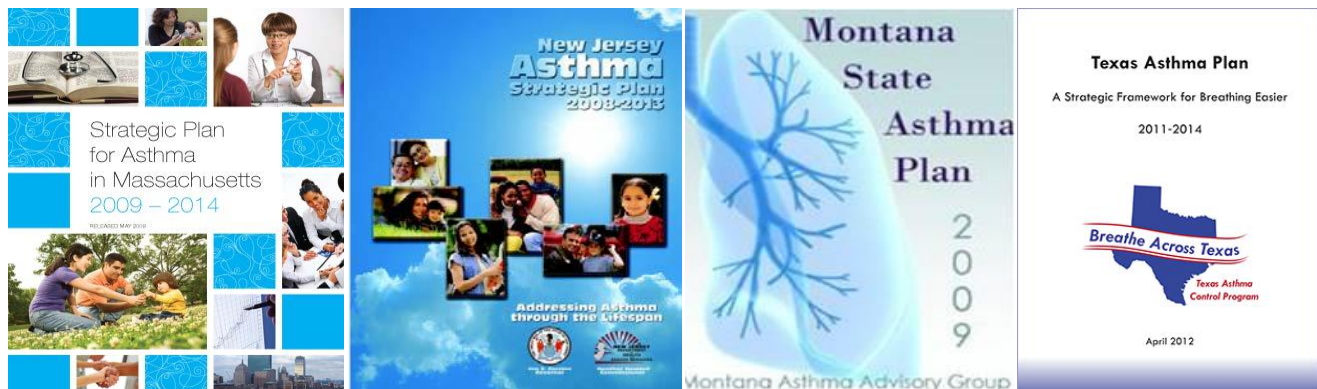
**Figure 3.** NACP funding for asthma activities 2001-2012.

# Success of State Asthma Control Programs

The key to NACP's success has been the integration of surveillance, partnerships, interventions, and evaluation, the building blocks of the Program. To receive funding, NACP requires states to conduct activities in these categories.

## Epidemiologic Surveillance

Accurate, timely surveillance data are essential for understanding the nature and patterns of asthma to improve planning, targeting, and implementing interventions. State and local health departments rely on asthma surveillance data to direct and to evaluate their efforts to reduce the burden of asthma. In their five-year state asthma plans, CDC requires funded state asthma programs to identify and document the goals, objectives, and strategies needed to reduce the burden of asthma (see Figure 4). CDC recently released the 2011 [Asthma State Profiles](#) to provide an overview of the burden of asthma in 34 states, the District of Columbia, and Puerto Rico.



**Figure 4.** State asthma plans from Massachusetts, New Jersey, Montana, and Texas.

CDC's Asthma Call-Back Survey (ACBS) is one of the most important tools public health officials use to track surveillance goals, evaluate programs, direct policy, and plan future activities. After a series of pilot tests beginning in 2003, the NACP implemented the ACBS as a follow-up survey to the Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a state-based system of health surveys that generate information about health risk behaviors, clinical preventive practices, and health care access and use. By 2010, the ACBS had expanded to 40 states, the District of Columbia, and Puerto Rico. States use ACBS data to measure state and local rates of asthma-related healthcare utilization, knowledge and skills in asthma self-management, number of lost days of work and school due to asthma, and other variables. Before the ACBS existed, none of this information was available at the state level.

The NACP also funds states to collect and analyze asthma surveillance data from hospitals, Medicaid records, and other sources, including records of hospitalizations, emergency department visits, and incidents of mortality.

This suite of asthma surveillance datasets forms a detailed picture of the burden of asthma at the state level. Coupled with CDC's national-level asthma data<sup>1</sup>, public health practitioners can now characterize asthma patterns and trends in much greater detail and report the most up-to-date statistics on asthma.

- Eight percent of Americans had asthma in 2009.
- More than nine people die from asthma every day; black Americans are two to three times more likely to die from asthma than any other racial or ethnic group.
- In 2011, 52% of people with asthma reported having an asthma attack within the last year; Oregon had the highest rate of asthma attacks (63.1%) and North Carolina had the lowest (40.8%)
- About 1 in 11 children and 1 in 12 adults had asthma in 2010; black children are twice as likely to have asthma as white children.
- Low-income populations, minorities, and children living in inner cities visit the emergency department more often and are more likely to be hospitalized or die due to asthma.
- Nearly one in two children with asthma reports missing at least one day of school each year because of asthma.
- Three in five people with asthma must limit their physical activity due to their asthma.

## **Partnerships with Asthma Programs and Organizations**

CDC promotes collaboration by actively recruiting and engaging both internal and external partners. Partners may include other programs within state health departments, state and local asthma coalitions, healthcare plans and providers, advocacy organizations, and other CDC-funded initiatives. State asthma control programs have significantly broadened the reach of their services by forming sustainable partnerships with other agencies and organizations committed to reducing the burden of asthma.

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<sup>1</sup> CDC periodically publishes national-level estimates on asthma prevalence and health care use based on data from the National Health Interview Survey, the National Ambulatory Medical Care Survey, the National Hospital Ambulatory Medical Care Survey, the National Hospital Discharge Survey, and the National Vital Statistics System.



### **District of Columbia Department of Health**

The mission of the Washington, D.C. Asthma Partnership (DCAP) is to establish a collaborative and sustainable infrastructure to prevent and reduce illness and death linked to asthma. DCAP consists of representatives from more than 80 public and private agencies, including hospitals, advocacy groups, senior citizens groups, child welfare organizations, and Medicaid. The partnership strives to develop effective, culturally appropriate health messages that promote improved asthma management. As part of other public education and outreach efforts, DCAP has hosted an Asthma Education Fair, launched a social media campaign, assisted public housing residents in becoming smoke-free, and worked with its partners to recognize and promote World Asthma Day. Since 2007, DCAP has educated thousands of Washington residents, helping to increase self-management and reduce asthma-related morbidity and mortality.



### **New York State Department of Health**

By 2006 the New York State Department of Health had established 11 Regional Asthma Coalitions reaching almost all counties and high risk neighborhoods in the state, including the Asthma Coalition of Long Island (ACLI). An estimated 62,000 children on Long Island suffer from asthma. Targeting children aged 0-4 years, ACLI trained 175 student nurses to educate 1,407 childcare and Head Start providers, each of whom cares for 20 children daily. Initial program results after one year of implementation, compared to rates before the intervention, show a 92% decrease in hospitalizations, 61% decrease in emergency department visits, and 87% decrease in unscheduled office visits for asthma.



### **Washington State Department of Health**

The Washington State Department of Health Asthma Program helps empower residents with the knowledge and tools to manage their asthma more effectively. Together with local and tribal partners, the program developed a three-visit protocol piloted through one county health department and two tribal clinic systems. Local health care workers or neighborhood volunteers visit individuals with asthma and focus on medication education, trigger identification and elimination, and self-management education. This team approach to asthma education includes primary health care providers and helps coordinate asthma care for better outcomes, as well as reaching those more disproportionately affected by the disease.



## Evidence-based Interventions to Reduce the Burden of Asthma.

The NACP first incorporated interventions into its cooperative agreement structure in 2002. That year the program funded grantees to implement two scientifically-evaluated asthma interventions: the Asthma and Allergy Foundation of America’s “Asthma Care Training for Kids” and the American Lung Association’s “Open Airways for Schools.” Surveillance data show that these interventions decrease acute care visits and hospitalizations and increase compliance with asthma care plans. By 2007, NACP funded all 36 grantees to develop and maintain a broad array of asthma interventions, including programs or campaigns for

- Adult-specific asthma education and prevention
- Asthma awareness, outreach, and communication
- Caregiver, school- and childcare center-based education and prevention
- Education and prevention targeted to underserved populations
- Trigger reduction and home visits
- Healthcare provider education and training
- Health plan coverage of asthma services
- Indoor air quality-based education and prevention
- Senior citizen-specific asthma education and prevention
- State systems-based change
- Tobacco use reduction

### Louisiana Chronic Disease Prevention and Control Unit

About 12% of households in Louisiana are home to children diagnosed with asthma. To address this concern, the Louisiana Asthma Management and Prevention Program developed a number of interventions to create asthma-friendly schools. Working with partners across the state, the program has educated more than 1,000 school personnel on asthma care and prevention and helped identify hundreds of additional children living with asthma. These districts also have an additional 260 action plans for students with asthma on file with their schools. All three school districts adopted indoor and outdoor air policies, such as requiring school buses to turn off their engines while waiting for students. These school-based activities are helping more than 13,000 Louisiana schoolchildren manage their asthma.



### Utah Department of Health

The Utah Asthma Telehealth program, initiated in February 2010, is an asthma education series specifically designed to keep health care professionals abreast of the latest information in asthma care and education. Participation is available via video-conference, telephone, and web streaming. The Utah Asthma Program has conducted 12 Telehealth sessions on various topics such as obesity and asthma, childhood versus adult-onset asthma, allergy testing, and difficult-to-control asthma. On average, about 60 providers attend each session.



### Evaluating Effectiveness and Impact of State Programs

CDC understands the value of evaluation to assess how well asthma programs are working and requires each grantee to have an experienced evaluator on staff to conduct and support evaluation. Each grantee must also develop a five-year strategic evaluation plan to measure progress toward program goals and objectives for the surveillance, partnerships, and interventions described in their state asthma plans. To support this effort and promote sound evaluation practice and consistency among grantees, the NACP developed the *Learning & Growing through Evaluation: State Asthma Program Evaluation Guide*. CDC, in partnership with the U.S. Environmental Protection Agency, also presented a series of webinars to guide asthma programs through the essential elements of evaluation.

Some NACP grantees' regular evaluations are beginning to show compelling results indicating a sound return on investment in the program.

### Connecticut Department of Health

The Connecticut Department of Health's Asthma Control Program developed the Putting on AIRS (Asthma Indoor Risk Strategies) Program to provide one-on-one education and environmental assessments to asthma patients and their families. An evaluation of the program demonstrated significant improvement in quality-of-life indicators compared to pre-enrollment in the AIRS program. Those indicators included reduced frequency of inhaler use, plus declines in emergency department visits (85%), asthma-related physician visits (67%), and days absent from school or work (62%). A net savings of \$26,720 per 100 patients was estimated at six months follow-up. In the last three years, Putting on AIRS and its local partners have reached 600 Connecticut families.



## Minnesota Department of Health

The Minnesota Department of Health (MDH) Asthma Program partnered with Pediatric Home Service, a home health care provider for medically fragile children, to conduct Reducing Environmental Triggers of Asthma (RETA), a demonstration project in homes of children with asthma. A key objective of the study was to demonstrate the return on investment for environmental management interventions. The project measured cost savings associated with reduced numbers of unscheduled office and hospital visits resulting from family-specific education and home visits conducted by a certified asthma educator. These efforts, coupled with provision of various trigger reducers (e.g., dust mite or allergen proof pillow and mattress encasements), resulted in an approximate cost savings of \$1,960 per patient over a 12-month period. Based in part on these results, several Minnesota agencies have received grant funds to implement asthma home visiting projects similar to RETA.



## NACP's National-Level Accomplishments

In addition to providing funding and technical support directly to state health departments, CDC partners with other federal and non-governmental agencies to promote national-level asthma control efforts in alignment with *Healthy People 2020* goals and objectives for asthma. The NACP supports collaborative projects and initiatives among CDC divisions, other programs within the U.S. Department of Health and Human Services (HHS), other federal agencies, and non-governmental organizations.

### HHS Partners

From inception, the NACP has provided financial and technical support as well as enhanced national-level surveillance. The NACP worked with CDC's National Center for Chronic Disease Prevention and Health Promotion to pilot two optional asthma prevalence questions to the BRFSS beginning in 1999. By 2000 the core questionnaire administered to all U.S. states and territories incorporated these questions. Around the

### Healthy People 2020 Objectives

1. Reduce asthma deaths
2. Reduce hospitalizations for asthma
3. Reduce emergency room visits for asthma
4. Reduce activity limitations among persons with current asthma
5. Reduce the proportion of persons with asthma who miss school or work days
6. Increase the proportion of persons with current asthma who receive formal patient education
7. Increase the proportion of persons with current asthma who receive appropriate asthma care according to National Asthma Education and Prevention Program (NAEPP) Guidelines
8. Increase the number of States, Territories, and the District of Columbia with a comprehensive asthma surveillance system for tracking asthma cases, illness, and disability at the State level

same time, the NACP partnered with the National Center for Health Statistics to use the National Health Interview Survey to collect data on asthma attacks, asthma management, asthma-related absenteeism, emergency room visits, and hospitalizations.

### **Other Federal Partners**

Experts from the NACP, the National Institutes of Health, and other governmental and non-governmental organizations contributed to the development of the National Asthma Education and Prevention Program Guidelines, the nation's gold standard for asthma care and management. The Guidelines identify critical measures thought to have the biggest impact on asthma care and patient health. Those measures include the use of inhaled corticosteroids to control asthma, use of a written asthma action plan to guide patient self-management, regular follow-up visits with a primary care provider, and control of environmental triggers that worsen the patient's asthma.

The NACP is also participating with other CDC partners, HHS agencies, the U.S. Environmental Protection Agency, and the U.S. Department of Housing and Urban Development on the *President's Coordinated Federal Action Plan to Reduce Racial and Ethnic Asthma Disparities*.

Spurred by the federal focus on environmental justice and recent data showing substantial disparities among poor and minority children with asthma compared to other demographic groups with asthma, the *Plan* describes four key strategies to address disparities and plans for federal agency collaborations on each strategy during the next 3-5 years.

#### **President's Coordinated Federal Action Plan to Reduce Racial and Ethnic Asthma Disparities: Strategies to Address Asthma Disparities**

1. Reduce barriers to the implementation of guidelines-based asthma management.
2. Enhance capacity to deliver integrated, comprehensive asthma care to children in communities with racial and ethnic asthma disparities.
3. Improve capacity to identify the children most impacted by asthma disparities.
4. Accelerate efforts to identify and test interventions that may prevent the onset of asthma among ethnic and racial minority children.

## **Cities and Local Health Departments**

The NACP provided funding to the Controlling Asthma in American Cities Project (CAACP), a locally-based collaborative in seven cities: Chicago, Minneapolis/St. Paul, New York, Oakland, Philadelphia, Richmond, and St. Louis. CAACP's goal was to develop comprehensive, culturally appropriate, localized asthma control plans targeting children (0–18 years) in inner-city areas with large unmet asthma control needs. Since the project ended in 2008, several CAACP sites have secured their own funding to sustain the efforts launched in 2002.

## **Schools**

The NACP plays a pivotal role in promoting “Asthma-Friendly Schools,” which are schools that follow policies and procedures allowing children to manage their asthma and thrive in the learning environment. Throughout the 2000s, the NACP worked with CDC's Division of Adolescent and School Health to fund various asthma control strategies across several urban school districts and created tools to assist them with program planning and monitoring. Two of these tools were the “Creating an Asthma-Friendly School” video and “Strategies for Addressing Asthma Within a Coordinated School Health Program,” a web-based guidance document for schools seeking to improve the health and attendance of students with asthma. Currently, most of the asthma work in school settings is supported by the states, based on local surveillance data and targeted interventions.

## **Non-governmental Organizations**

Since 2002 the NACP has partnered with non-governmental organizations to carry out or fund activities and initiatives aimed at reducing the burden of asthma.

- CDC collaborated with the Allergy and Asthma Network/Mothers of Asthmatics and the Asthma and Allergy Foundation of America to develop asthma tools and programs for CDC grantees. Large hospital systems, urban hospitals, city health departments, school systems, and local chapters of national asthma organizations are now implementing these tools.
- The NACP supported the work of the American Lung Association and other national asthma advocacy organizations to encourage all 50 states to pass “self-carry” laws for asthma medication.
- In partnership with the Task Force on Community Preventive Services, an independent, nonfederal body of public health and prevention experts, the NACP systematically reviewed the effectiveness of home-based, multi-trigger, multi-component educational and environmental interventions. The NACP is currently working with state and local asthma control programs to implement these interventions and evaluate their impact.



- With the National Institute of Environmental Health Sciences and the American Legion Child Welfare Foundation, the NACP funded development of *Environmental Management of Pediatric Asthma: Guidelines for Health Care Providers*, produced by the National Environmental Education Foundation. The Guidelines teach health care providers how to incorporate management of environmental asthma triggers into pediatric practice and how to communicate with patients about effective home-based interventions.

## Plans for the Future

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The last 30 years of asthma surveillance data tell an important story with potential implications for the future. Asthma prevalence rose sharply in the 1980s and 1990s, as did the incidence of adverse outcomes related to asthma. Hospitalization rates increased at an average rate of 2.9% per year from 1980 to 1984 and then slowed to 1.2% per year from 1984 to 2009. Death rates increased from 1980 to 1989, leveled off from 1989 to 1998, and then decreased from 1999 to 2009. This decline in deaths is the most important indicator of the success of the NACP's investment in reducing the burden of asthma.

Since 1999, CDC has worked to establish a network of asthma control programs to build capacity and implement sustainable programs and policies at the federal, state, and local levels. The NACP's success is based on a foundation of robust surveillance data; targeted, evidence-based interventions; partnerships that conserve resources and enhance impact; and evaluation to gauge program effectiveness and make improvements. But this work has just begun.

Reducing morbidity associated with asthma remains a major public health challenge, even more so for populations disproportionately affected by asthma. The rate at which Americans are diagnosed with asthma has slowed since the 1990s, but it is still growing.

To lose momentum now, when the trends are beginning to indicate long-term progress in reducing the burden of asthma, could come at a high cost to those living with asthma and to the nation's economy.

With continued and increased funding, CDC hopes to expand the NACP to all U.S. states and territories and to build upon its many successes. Reducing asthma's burdens of mortality, morbidity, and societal costs serves the entire nation, and much work remains to be done.

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